CDM Smith

Memorandum

To: *Mike Cirian, USEPA*

From: *Erin Formanek*

Date: *October 16, 2015*

Subject: *Decision Questions and Screening Values for Use in the Phase 1 Site Characterization Sampling and Analysis Plan, Former Primary Aluminum Reduction Facility, Columbia Falls, Montana*

I. Introduction

Per your request, CDM Smith has drafted decision questions and statements as well as screening values that are recommended for use for at the Site. In preparing these questions, it was assumed the collection of data for evaluation of human health and ecological risk or for the development and evaluation of remedial alternatives are not the goasl of this Phase I sampling effort. Rather, this initial data collection effort is intended to gather data regarding sources of chemicals of potential concern (COPCs), nature and extent of contamination, and understand the transport and fate of COPCs in environmental media. If it is determined these data are in fact intended to support the overall objectives of the Site remedial investigation (RI) (i.e., support risk assessment evaluation and the development and evaluation of remedial alternatives), additional decision and estimation questions would need to be developed and included in the Phase I Site Characterization Sampling and Analysis Plan (Phase I SAP).

II. Decision Questions and Statements

The U.S. Environmental Protection Agency (EPA) has developed a seven-step process for establishing data quality objectives (DQOs) to help ensure that data collected during a field sampling program will be adequate to support reliable decision-making (EPA 2006). The following questions and statements were developed in accordance with this DQO guidance and based on the information provided in Section 4 of the draft *Phase I Site Characterization Sampling and Analysis Plan* dated June 5, 2015, and are recommended for use in the Phase I SAP. These questions should be referred to throughout the DQO steps, in particular in Step 3 (Identify Information Inputs), Step 5 (Decision Problem Statements), and Step 6 (Decision Error Limits and Uncertainty Evaluation).

- *Question 1:* Do inorganic and organic chemical concentrations in Site surface soil, subsurface soil, soil gas, surface water, sediment, and groundwater exceed project screening levels?

Decision Statement: Determine if concentrations in Site surface soil, subsurface soil, soil gas, surface water, sediment, and groundwater are above screening levels and should be identified as COPCs.

- *Question 2:* What is the extent of COPCs in Site surface soil, subsurface soil, soil gas, surface water, sediment, and groundwater?

  Estimation Statement: Estimate the areal and vertical extent of COPC contamination in Site surface soil, subsurface soil, soil gas, surface water, sediment, and groundwater.

- *Question 3:* Do COPC concentrations in Site surface soil, subsurface soil, surface water, sediment porewater, sediment, and groundwater exceed reference conditions?

  Decision Statement: Determine if COPC concentrations in Site surface soil, subsurface soil, surface water, sediment porewater, sediment, and groundwater are statistically greater than reference concentrations and are identified as Site-related COPCs.

- *Question 4:* Are there potential source areas present at the Site, beyond those already identified in the conceptual site model (CSM) (i.e., landfills, percolation ponds, plant drainage system including dry wells, drum storage area, underground storage tanks [USTs], above-ground storage tanks [ASTs], and waste and raw materials storage and handling areas)?

  Decision Statement: Determine if additional source areas/Site features are present at the Site where COPCs potentially were released, based upon visual inspection of waste materials, soil piles, staining, stressed vegetation, etc., which will require additional characterization.

- *Question 5:* How are COPCs in Site surface soil, subsurface soil, and groundwater moving throughout the Site?

  Estimation Statement: Evaluate the fate and transport of COPCs throughout Site surface soil, subsurface soil, and groundwater. Parameters needed to inform this assessment include estimates of the depth to groundwater, identification of the aquifer types that are present (e.g., unconfined/confined, alluvial/bedrock), hydraulic gradients, as well as measurements of soil and water quality characteristics (e.g., pH, soil particle size, buffering capacity).

- *Question 6:* What are the subsurface characteristics and Site features that are important to understand prior to conducting drilling activities?

  Estimation Statement: Evaluate the geophysical nature of the subsurface characteristics and features of the Site. Parameters needed to inform this assessment include estimates of the depth to bedrock, estimates of the depth to groundwater, identify changes in subsurface hydrogeological conditions, identify subsurface anomalies that may contribute to the delineation of source areas, etc.

III. Screening Level Sources

The sources below should be used in selecting screening levels. For the purposes of identifying COPCs, the lowest value, across all sources, should be selected as the screening level. In cases where a single source provides multiple values (e.g., a no-effect value and a low-effect value), the lowest value should be used.

A. Ecological

Ecological screening levels should be gathered from the following sources, as indicated for each media type:

<u>Soil</u>

- EPA Ecological Soil Screening Levels: http://www.epa.gov/ecotox/ecossl/
- Los Alamos National Laboratory (LANL) ECORISK Database, Los Alamos, New Mexico. http://www.lanl.gov/community-environment/environmental-stewardship/protection/eco-risk-assessment.php
- Sample, BE, DM Opresko, GW Suter II. 1996. *Toxicological Benchmarks for Wildlife: 1996 Revision.* Oak Ridge National Laboratory. Document ES/ER/TM-86/R3. June 1996. http://www.esd.ornl.gov/programs/ecorisk/documents/tm86r3.pdf
- *Region 5 RCRA Ecological Screening Levels*, August 22. http://www.epa.gov/Region5/waste/cars/esl.htm

<u>Surface Water and Groundwater</u>

- EPA National Recommended Water Quality Criteria: http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm
- Suter II, GW and CL Tsao. 1996. *Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision.* Oak Ridge National Laboratory. Document ES/ER/TM-96/R2. June 1996. http://www.esd.ornl.gov/programs/ecorisk/documents/tm96r2.pdf
- Canadian Council of Ministers of the Environment (CCME). *Canadian Water Quality Guidelines, Summary Table,* http://st-ts.ccme.ca/
- Montana Department of Environmental Quality (DEQ) Circular DEQ-7: http://www.deq.mt.gov/wqinfo/circulars.mcpx

<u>Sediment</u>

- MacDonald, D.D., C.G. Ingersoll, and T.A. Berger. 2000. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems. *Archives of Environmental Contamination and Toxicology* 39:20-31.
- Ingersoll, C.G., P.S. Haverland, E.L. Brunson, T.J. Canfield, F.J. Dwyer, C.E. Henke, N.E. Kemble,

D.R. Mount, and R.G. Fox. 1996. Calculation and evaluation of sediment effect concentrations for the amphipod *Hyalella azteca* and the midge *Chironomus riparius. J. Great Lakes Res.* 22:602-623.

B. Human Health Screening Levels

Human health screening levels should be gathered from the following sources as indicated for each media type. Human health risk-based screening levels (RSLs) provided in the EPA Risk-Based Screening Tables should all be based on target cancer risk of 1E-06 and target hazard quotient of 0.1. For the purposes of identifying COPCs, the lowest value, across all sources, should be selected as the screening level.

Soil

- EPA Risk-Based Screening Tables: residential soil RSL, Risk-based soil screening level (SSL) for the protection of groundwater

Surface Water and Groundwater

- EPA Risk-Based Screening Tables: tapwater RSL, drinking water maximum contaminant level (MCL)
- Montana DEQ Circular DEQ-7: http://www.deq.mt.gov/wqinfo/circulars.mcpx

Sediment

- EPA Risk-Based Screening Tables: residential soil RSL